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**A development of PM2.5 forecasting system using physicochemical models and ensemble machine learning**

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Ambient exposure to PM2.5 is harmful effect on public health and the forecasting PM2.5 is essential to protect the public health in advance. Current PM2.5 forecasting systems in operation are mainly based on the physicochemical models such as CMAQ and WRF. The forecasting accuracy of them however, have substantial limits due to uncertainty of input data of anthropogenic emissions and meteorological fields as well as the physicochemical models themselves.

In order to overcome the drawback of the prognostic model predictions and to take advantage of the recent advance in machine learning algorithm, the PM2.5 forecasting system using physicochemical models of CMAQ and WRF as well as ensemble machine learning method is being developed and tested for national PM2.5 forecasting in Korea. The various levels of big data based on observation and model outputs and machine learning methods to reflect temporal variations and spatial characteristic PM2.5 between the source and receptor regions will be discussed in detail.